

CLAIMS

1. A method of patterning a functional material onto a substrate, comprising the steps of (a) applying a layer of protective material, soluble in a solvent in which the functional material is insoluble, to at least one major surface of said substrate; (b) removing areas of said layer to gain access to the substrate in well-defined regions; (c) depositing the functional material at least onto the substrate in the well-defined regions; and (d) removing the remaining layer of protective material from the substrate by dissolution in said solvent.
2. The method of claim 1, wherein said substrate comprises glass.
3. The method of claim 1, wherein said substrate comprises silicon.
4. The method of claim 1, wherein said substrate comprises plastics material.
5. The method of any preceding claim, wherein said substrate comprises a charge injection layer.
6. The method of any preceding claim, wherein said protective material comprises organic material.
7. The method of claim 6, wherein said layer of protective material comprises a water soluble polymer selected from poly(vinyl alcohol), polymethyl ether, polymethylacrylamide, doped polythiophene, polyethylene glycol and doped polyaniline.
8. The method of claim 6, wherein said layer of protective material comprises an alcohol soluble polymer.
9. The method of any preceding claim, wherein said protective material comprises inorganic material.

10. The method of claim 9, wherein said protective material is selected from silicon, silicon nitride and silicon oxide.
- 5 11. The method of any preceding claim, wherein a layer of a second protective material is applied subsequent to step (a), is removed in the well-defined regions in step (b) and is subsequently removed other than in the well-defined regions.
- 10 12. The method of claim 11, wherein said layer of second protective material comprises an inorganic layer.
13. The method of claim 12, wherein said layer of second protective material is selected from silicon, silicon nitride and silicon oxide.
- 15 14. The method of claim 11, wherein said layer of second protective material comprises a metal layer.
15. The method of claim 14, wherein said layer of second protective material is selected from nickel, aluminum and chromium.
- 20 16. The method of any preceding claim, wherein in step (b) said protective material is removed from the well-defined regions by laser ablation.
- 25 17. The method of any preceding claim, wherein in step (b) said protective material is removed from the well-defined regions using a lift off process.
18. The method of any one of claims 11 to 15, wherein in step (b) said layer of second protective material is removed from the well-defined regions using a first process to expose said areas of said protective material and wherein said areas of said protective material are removed using a second process to gain access to the substrate.
- 30

19. The method of claim 18, wherein said first process comprises laser ablation.
20. The method of claim 18, wherein said first process comprises a stamping or
5 puncturing process.
21. The method of claim 18, wherein said first process comprises a
photolithography step to define and expose said layer of second protective
material in the well-defined regions and said second process comprises an
10 etching step to remove said second protective material in the well-defined
regions.
22. The method of any preceding claim, wherein in step (c) the functional
material is deposited by a method selected from spin coating, evaporation,
15 and sputtering.
23. The method of any preceding claim, wherein after step (c) an additional layer
of protective material is applied over the functional material, said additional
layer being removed in step (d).
- 20 24. The method of claim 23, wherein said additional layer comprises the same
protective material, soluble in a solvent in which the functional material is
insoluble.
- 25 25. The method of any preceding claim, wherein said functional material
comprises an organic electro-optically active material.
26. The method of any one of claims 1 to 24, wherein said functional material
comprises a biochemical or biological reagent.

27. The method of any preceding claim, comprising further steps of patterning a further functional material to the substrate, the further steps comprising repeating steps (a) to (d) for the further functional material.
- 5 28. The method of any one of claims 1 to 26, comprising the steps of after step (c), applying an additional layer of protective material; removing areas of said additional layer to gain access to the substrate in additional well-defined regions; and depositing an additional functional material at least onto the substrate in the additional well-defined regions.
- 10 29. A device comprising a substrate bearing patterned electroluminescent material, the substrate and electroluminescent material being covered by first and/or second layers of protective material, said layers having apertures giving access to well-defined regions of the substrate.
- 15 30. An optoelectronic device comprising a substrate and a plurality of sub-pixels comprising polymer light emitting diodes arranged to emit light of different colors, the spacing between said sub-pixels being less than 15 μm .
- 20 31. An optoelectronic device according to claim 30, wherein said spacing is less than 10 μm .
32. An optoelectronic device according to claim 31, wherein said spacing is less than 5 μm .
- 25 33. An optoelectronic device according to claim 30, 31 or 32, comprising a quarter video graphic array (QVGA) device.